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Implementing measures EC/244/2009 (Non-directional household lamp) Seminar

实施措施EC/244/2009 非定向家用灯

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COMMISSION REGULATION (EC) No 244/2009 of 24 March,2009
2009年3月24日欧共体委员会法规(EC) No 244/2009

- implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for **non-directional household lamps**
  贯彻欧洲议会和欧洲委员会的指令2005/32/EC中：非定向家用灯生态设计要求

- Enters into force: 13.04.2009 2009年4月13日开始生效

Keypoint:要点

- Scope (Article 1) 范围 （第1条）
- Ecodesign requirement (Article 3, Annex II) 生态化设计要求 （第3条，附件II）
- Management requirement (Article 4) 管理需求 （第4条）
- Verification (Article 5, Annex III) 验证 (第5条，附件III)
- Benchmark (Article 6, Annex IV) 基准 (第6条，附件IV)

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- This Regulation establishes ecodesign requirements for the placing on the market of non-directional household lamps, including when they are marketed for non-household use or when they are integrated into other products. It also establishes product information requirements for special purpose lamps
- 此法规确定了涉及到市场上的非定向家用灯(包括销售目的为非家用和整合至其他产品的灯)的生态化设计要求，同时也为特殊用途的灯提出了产品信息要求。

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Household Room Illumination: means the full or partial illumination of a household room, by replacing or complementing natural light with artificial light, in order to enhance visibility within that space;
家庭的室内照明：指的是家庭室内的全部或部分照明，为了在该空间范围内提高能见度，通过人造光替代或补足自然光；

Household Lamp:means a lamp intended for household room illumination; it does not include special purpose lamps
家用灯：指的是某种用于家庭室内照明的灯；其不包括特定用途的灯。

Special Purpose Lamp:means a lamp not intended for household room illumination because of its technical parameters or because the related product information indicates that it is unsuitable for household room illumination;
特定用途的灯：指的是因为其技术参数，或因为有关的产品信息显示其不适合家庭室内的照明，因此不是打算供家庭室内照明的灯

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Non-directional halogen lamp
非定向灯

Directional halogen lamp (reflector lamp)
定向灯（射灯）

Directional lamp: means a lamp having at least 80 % light output within a solid angle of π sr (corresponding to a cone with angle of 120°);
定向灯：指的是在π sr的立体角范围内具有80%光输出（相当于120°锥角）的灯；

Non-directional lamp: means a lamp that is not a directional lamp;
非定向灯：指的是一种不是定向灯的灯；

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Clear (transparent) lamp
透明灯

Non-clear lamp
不透明灯

Clear lamp: is a lamp (excluding compact fluorescent lamps) with a luminance above 25 000 cd/m2 for lamps having a luminous flux below 2 000 lm and above 100 000 cd/m2 for lamps having more luminous flux, equipped with only transparent envelopes in which the light producing filament, LED or discharge tube is clearly visible;
透明灯:指的是一种具有低于2000 lm光通量的灯有超过25000cd/m²的亮度，以及具有更高光通亮的灯有100000cd/m²亮度的灯（不包括紧凑型荧光灯），只配有透明玻壳，在其中产生光的灯丝、发光二极管或放电管清晰可见；

Non-clear lamp: is a lamp that does not comply with the specifications under point (d), including compact fluorescent lamps; (e)
“不透明灯”是一种不符合“透明灯”规范的灯，包括紧凑型荧光灯

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Compact fluorescent lamp:means a unit which cannot be dismantled without being permanently damaged, provided with a lamp cap and incorporating a fluorescent lamp and any additional components necessary for starting and stable operation of the lamp;
紧凑型荧光灯:指的是一种除非永久性损坏，否则不能拆除的，配有一个灯头，并且与荧光灯及所有用于启动和灯的稳定工作必需的附件一体化的灯；

Compact fluorescent lamp
紧凑型荧光灯

Second lamp envelope:is a second outer lamp envelope which is not required for the production of light, such as an external sleeve for preventing mercury and glass release into the environment in case of lamp breakage, for protecting from ultraviolet radiation or for serving as a light diffuser;
第二层玻壳：是非产生光所需要的灯的第二层外部玻壳，诸如在灯破损的情况下防止汞和玻璃释放到环境中的外部玻壳，适合于防止紫外线辐射或用作光发散；

Compact fluorescent lamp
With second lamp envelope
有第二层玻壳的紧凑型荧光灯

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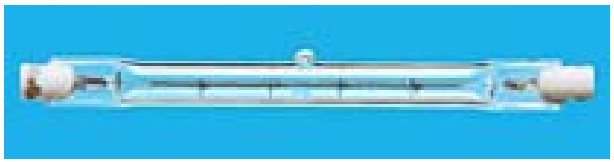
Standard incandescent lamp



Conventional halogen lamps

LED

B-class pear-shaped retrofit halogen lamp with integrated transformer

C-class pear-shaped retrofit halogen lamp

Compact fluorescent lamps with bare tubes and with bulb-shaped outer lamp envelope

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This Regulation shall not apply tothe following household and special purpose lamps:
此法规不适用于以下家用灯和特殊用途的灯：

(a) lamps having the following chromaticity coordinates x and y具有下列色度坐标的灯：

— x < 0,200 or x > 0,600

— y < – 2,3172 x2 + 2,3653 x – 0,2800 or y > – 2,3172 x2 + 2,3653 x – 0,1000;

(b) directional lamps 定向灯;

(c) lamps having a luminous flux below 60 lumens or above 12 000 lumens
光通量低于60流明或高于12000流明的灯;

(d) lamps having(UV lamp) 具有以下特征的灯:

— 6 % or more of total radiation of the range 250-780 nm in the range of 250-400 nm
在250-400 nm的范围内总照射范围250-780 nm的6%或更多,

— the peak of the radiation between 315-400 nm (UVA) or 280-315 nm (UVB)
辐射峰值在315-400 nm(UVA)或280-315nm（UVB）之间;

(e) fluorescent lamps without integrated ballast 不带集成式镇流器的荧光灯;

(f) high-intensity discharge lamps 高强度气体放电灯;

(g) incandescent lamps with E14/E27/B22/B15 caps, with a voltage equal to or below 60 volts and without integrated transformer in Stages 1-5 according to Article 3
在第一至第五阶段带有E14/E27/B22/B15灯头、电压不大于60伏特、不带集成式变压器的白炽灯.

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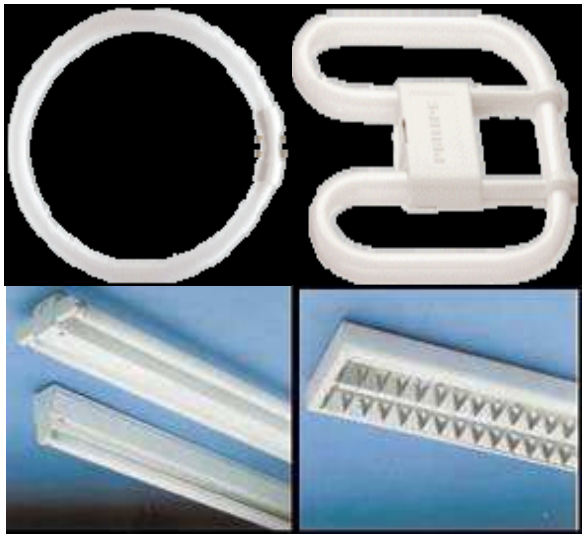
Spot lights with halogen lamps at a reception desk
前台卤钨射灯



fluorescent lamps without integrated ballast
不带集成式镇流器的荧光灯

lamps having a luminous flux below 60 lumens
光通量低于60流明

high-intensity discharge lamps
高强度气体放电灯

Each ecodesign requirement shall apply in accordance with the following stages:
每一项生态设计要求应当根据以下阶段应用：

Stage 1: 1 September 2009
Stage 2: 1 September 2010
Stage 3: 1 September 2011
Stage 4: 1 September 2012
Stage 5: 1 September 2013
Stage 6: 1 September 2016

Starting from 1 September 2009:

For special purpose lamps, the following information shall be clearly and prominently indicated on their packaging and in all forms of product information accompanying the lamp when it is placed on the market:对于**特定用途的灯**，当其投放市场时，下列信息应当清楚和显著的显示在其包装上，以及该灯随附的所有形式的产品信息上

(a) their intended purpose; and 其预期的用途；以及

(b) that they are not suitable for household room illumination.其不适合家庭室内的照明

The technical documentation file shall list the technical parameters (if any) that make the lamp design specific for the special purpose indicated on the packaging.
技术文件应当在包装上显示的特定用途，列出该灯特殊设计的技术参数（如果有）

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1.Lamp efficacy requirements灯的能效要求

Incandescent lamps **with S14, S15 or S19 caps** shall be **exempted** from the efficacy requirements of Stages 1 to 4 as defined in Article 3 of this Regulation, but not from Stages 5 and 6.按照本法规第3条的规定，带有S14、S15 或S19灯头的白炽灯应当从第1阶段至第4阶段的光效能要求中免除，但不从第5阶段和第6阶段中免除

Incandescent lamps with S14, S15 or S19 caps
带有S14、S15 或S19灯头的白炽灯(豁免）

Table 1 The maximum rated power (Pmax) for a given rated luminous flux (Φ)
表1适合于指定的额定光通量 (Φ)(W)的最大额定功率(P_{max})

Application date 实施日期	Clear lamps 透明灯	Non-clear lamps 不透明灯
Stages 1 to 5 第1至第5阶段	0,8 * (0,88√Φ+0,049Φ) (Class C)	0,24√Φ+0,0103Φ (Class A)
Stage 6 第6阶段	0,6 * (0,88√Φ+0,049Φ) (Class B)	0,24√Φ+0,0103Φ (Class A)

1.Lamp efficacy requirements

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Table 2 Listed the exceptions to these requirements 表2能效要求豁免清单

Scope of the exception 例外的范围	Maximum rated power (W) 最大额定功率 (W)
Clear lamps 60 lm ≤ Φ ≤ 950 lm in Stage 1 在第1阶段透明的灯60 lm ≤ Φ ≤ 950 lm	Pmax = 1,1 * (0,88√Φ+0,049Φ)
Clear lamps 60 lm ≤ Φ ≤ 725 lm in Stage 2) 在第2阶段透明的灯60 lm ≤ Φ ≤ 725 lm	Pmax = 1,1 * (0,88√Φ+0,049Φ
Clear lamps 60 lm ≤ Φ ≤ 450 lm in Stage 3 在第3阶段透明的灯 60 lm ≤ Φ ≤ 450 lm	Pmax = 1,1 * (0,88√Φ+0,049Φ)
Clear lamps with G9 or R7s cap in Stage 6在第6阶段带有G9 或R7s 灯头的透明的灯	Pmax = 0,8 * (0,88√Φ+0,049Φ)

Table 3 the correction factors applicable to the maximum rated power 表3最大额定功率校正因数

Scope of the correction 校正范围	Maximum rated power (W) 最大额定功率 (W)
filament lamp requiring external power supply 需要外部电源的白炽灯	P_{max} / 1.06
discharge lamp with cap GX53 带有GX53灯头的放电灯	P_{max} / 0.75
non-clear lamp with colour rendering index ≥ 90 and P ≤ 0,5 * (0,88√Φ+0,049Φ) 显色性指数≥ 90和 P ≤ 0.5 * (0.88√Φ+0.049Φ)的不透明的灯	P_{max} / 0.85
discharge lamp with colour rendering index ≥ 90 and Tc ≥ 5 000 K 显色性指数≥ 90和Tc >=5000K的放电灯	P_{max} / 0.76
non-clear lamp with second envelope and P ≤ 0,5 * (0,88√Φ+0,049Φ) 带有第二层玻壳并且P ≤ 0.5 * (0.88√Φ+0.049Φ)的不透明的灯	P_{max} / 0.95
LED lamp requiring external power supply 需要外部电源的发光二极管灯	P_{max} / 1.1

Grey cells indicate the technology in question is still available at the given time, white cells mean that the technology is phased out according to the provisions given in the "Requirement" column.

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	Non-clear lamps				Clear lamps							
Date	Requirement	Incan-descent	All Halogen	CFL / LED	Requirement	Incandescent / Conventional halogen				Halogen C	Halogen B	LED [1]
						≥ 100 W	≥ 75 W	≥ 60 W	60 W >			
Today	None				None							
September 2009 [1]	A[2]				C for ≥ 100W [3]		≥ E[3]	≥ E[3]	≥ E[3]			
September 2010	A[2]				C for ≥ 75W [3]			≥ E[3]	≥ E[3]			
September 2011	A[2]				C for ≥ 60W [3]				≥ E[3]			
September 2012	A[2]				C for all							
September 2013	Second level of functionality requirements [1]											
Review 2014	Review											
September 2016	A[2]				B / C [4]					[4]		

[1] First level of functionality requirements introduced in first stage. LEDs are exempted from all functionality requirements.

[2] Refers to lamp energy label class. Correction factors apply to certain lamps, allowing them to be B-class.

[3] Minimum requirement for all lamps: E class. F and G lamps phased out.

[4] Only special cap halogen lamps are allowed to be class C.

2. Lamp functionalty requirements

Table 4 Functionality requirements for compact fluorescent lamps表4 适合于紧凑型荧光灯的性能要求

Functionality parameter 性能参数	**Stage 1** 第1阶段	**Stage 5** 第5阶段
Lamp survival factor at 6 000 h 在**6000**小时灯的残存率	**≥ 0.50**	**≥ 0.70**
Lumen maintenance 流明维持率	At 2 000 h(≥ 80 % for lamps with second lamp envelope) 在**2000**小时：**≥ 85% (**带有第二层玻壳的灯**≥ 80%)**	At 2 000 h: ≥ 88 % (≥ 83 % for lamps with second lamp envelope) 在**2000**小时：**≥ 88% (**带有第二层玻壳的灯**≥ 83%)** At 6 000 h: ≥ 70 %；在**6000**小时：**≥70%**
Number of switching cycles before failure 在损坏之前的开关周期数	≥ half the lamp lifetime expressed in hours **≥** 以小时表示的灯的寿命的一半 ≥ 10 000 if lamp starting time > 0,3 s **≥ 10 000** 如果灯的启动时间**> 0.3**秒	≥ lamp lifetime expressed in hours **≥**以小时表示的灯的寿命 ≥ 30 000 if lamp starting time >0.3s **≥ 30000** 如果灯的启动时间 **> 0.3**秒
Starting time 启动时间	< 2,0 s **< 2.0**秒	< 1,5 s if P < 10 W; 如果 **P < 10W,< 1.5**秒 < 1,0 s if P ≥ 10 W; 如果**P ≥ 10W ,< 1.0**秒
Lamp warm-up time to 60 % Φ 达到**60% Φ**灯的预热时间	< 60 s；**< 60**秒 or < 120 s for lamps containing mercury in amalgam form 或含有汞齐灯 **< 120**秒	< 40 s；**< 40**秒 or < 100 s for lamps containing mercury in amalgam form 或含有汞齐灯 **< 100**秒
Premature failure rate 过早损坏率	**≤ 2,0 % at 200 h** 在**200**小时**≤ 2.0%**	≤ 2,0 % at 400 h； 在**400**小时**≤ 2.0%**
UVA + UVB radiation长波紫外线（**UVA**）**+**中波紫外线（**UVB**）辐射	**≤ 2.0 mW/klm**	**≤ 2.0 mW/klm**
UVC radiation 短波紫外线（**UVC**）辐射	**≤ 0.01 mW/klm**	**≤ 0.01 mW/klm**
Lamp power factor 灯的功率因数	≥ 0,50 if P < 25 W;如果 **P < 25W，≥ 0.50** ≥ 0,90 if P ≥ 25 W;如果 **P ≥ 25W，≥ 0.90**	≥ 0,55 if P < 25 W;如果 **P < 25W，≥ 0.55** ≥ 0,90 if P ≥ 25 W;如果 **P ≥ 25W，≥ 0.90**
Colour rendering (Ra) 显色性 **(Ra)**	**≥ 80**	**≥ 80**

2. Lamp functionalty requirements

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Table 5 Functionality requirements for lamps excluding compact fluorescent lamps and LED lamps
表5 –适合于除紧凑型荧光灯和发光二极管灯之外的灯的功能性要求

Functionality parameter 性能参数	**Stage 1** 第1阶段	**Stage 5** 第5阶段
Rated lamp lifetime 额定灯的寿命	≥ 1 000 h ≥ **1000**小时	≥ 2 000 h ≥ **2000**小时
Lumen maintenance 流明维持率	≥ 85 % at 75 % of rated average lifetime ≥ **85%**，在额定平均寿命的**75%**	≥ 85 % at 75 % of rated average lifetime ≥ **85%**，在额定平均寿命的**75%**
Number of switching cycles 开关周期数	≥ four times the rated lamp life expressed in hours ≥ 以小时表示的灯的额定寿命的四倍	≥ four times the rated lamp life expressed in hours ≥以小时表示的灯的额定寿命的四倍
Starting time 启动时间	< 0,2 s < **0.2**秒	< 0,2 s < **0.2**秒
Lamp warm-up time to 60 % Φ 达到**60% Φ**灯的预热时间	≤ 1,0 s ≤ **1.0**秒	≤ 1,0 s ≤ **1.0**秒
Premature failure rate 过早损坏率	**≤ 5,0 % at 100 h** ≤ **5.0%@100**小时	≤ 5,0 % at 200 h ≤ **5.0%@200**小时
Lamp power factor 灯的功率因数	≥ **0.95**	≥ **0.95**

2. Lamp functionalty requirements

Where the rated lamp lifetime is higher than 2 000 h, the Stage 1 requirements for the parameters ‘Rated lamplifetime’, ‘Lamp Survival Factor’ and ‘Lumen maintenance’ in Tables 4 and 5 are only applicable as from Stage 2.

在灯的额定寿命高于2000小时的情况下，表4和表5中关于“灯的额定寿命”、“灯的残存率”，以及“流明维持率”的第1阶段参数要求只从第2阶段开始。

For the purposes of testing the number of times the lamp can be switched on and off before failure, the switching cycle shall consist of periods comprising 1 minute on and 3 minutes off, while the other test conditions are defined according to Annex III.

为了测试灯在损坏之,前的开启和关闭的次数，开关周期应当由包含1分钟开启和3分钟关闭的周期组成，而其它测试条件依照附件III的规定。

For the purposes of testing lamp lifetime, lamp survival factor, lumen maintenance and premature failure, the standard switching cycle according to Annex III shall be used.

为了测试灯的寿命、灯的残存率、流明维持率和过早损坏率，应当使用依照附件III 的标准开关周期

3. PRODUCT INFORMATION REQUIREMENTS ON LAMPS

For non-directional household lamps, the following information shall be provided as from Stage 2, except where otherwise stipulated.

3.1. Information to be visibly displayed prior to purchase to end-users on the packaging and on free access websites

The information does not need to be specified using the exact wording of the list below. It may be displayed using graphs, figures or symbols rather than text.

These information requirements do not apply to filament lamps not fulfilling the efficacy requirements of Stage 4.

(a) When the nominal lamp power is displayed outside the energy label in accordance with Directive 98/11/EC, the nominal luminous flux of the lamp shall also be separately displayed in a font at least twice as large as the nominal lamp power display outside the label;

(b) Nominal life time of the lamp in hours (not higher than the rated life time);

(c) Number of switching cycles before premature lamp failure;

(d) Colour temperature (also expressed as a value in Kelvins);

(e) Warm-up time up to 60 % of the full light output (may be indicated as ‘instant full light’ if less than 1 second);

(f) A warning if the lamp cannot be dimmed or can be dimmed only on specific dimmers;

(g) If designed for optimal use in non-standard conditions (such as ambient temperature Ta ≠ 25 °C), information on those conditions;

(h) Lamp dimensions in millimeters (length and diameter);

3. PRODUCT INFORMATION REQUIREMENTS ON LAMPS

(i) If equivalence with an incandescent lamp is claimed on the packaging, the claimed equivalent incandescent lamp power (rounded to 1 W) shall be that corresponding in Table 6 to the luminous flux of the lamp contained the packaging.

The intermediate values of both the luminous flux and the claimed incandescent lamp power (rounded to 1W) shall be calculated by linear interpolation between the two adjacent values.

Rated lamp luminous flux Φ [lm]			**Claimed equivalent incandescent lamp power**
CFL	Halogen	LED and other lamps	**[W]**
125	119	136	15
229	217	249	25
432	410	470	40
741	702	806	60
970	920	1055	75
1398	1326	1521	100
2253	2137	2452	150
3172	3009	3452	200

(j) The term ‘energy saving lamp’ or any similar product related promotional statement about lamp efficacy may only be used if the lamp complies with the efficacy requirements applicable to non-clear lamps in Stage 1 according to Tables 1, 2 and 3.

If the lamp contains mercury

(k) Lamp mercury content as X,X mg;

(l) Indication which website to consult in case of accidental lamp breakage to find instructions on how to clean up the lamp debris.

3.2. Information to be made publicly available on free-access websites

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As a minimum, the following information shall be expressed at least as values.

(a) The information specified in point 3.1;

(b) Rated wattage (0,1 W precision);

(c) Rated luminous flux;

(d) Rated lamp life time;

(e) Lamp power factor;

(f) Lumen maintenance factor at the end of the nominal life;

(g) Starting time (as X,X seconds);

(h) Colour rendering.

If the lamp contains mercury

(i) Instructions on how to clean up the lamp debris in case of accidental lamp breakage;

(j) Recommendations on how to dispose of the lamp at its end of life.

Member State authorities shall test a sample batch of minimum 20 lamps of the same model from the same manufacturer randomly selected.

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Measured parameter	Organisation	Reference	Title
Lamp mercury content	European Commission	Decision 2002/747/EC (Annex)	Commission Decision 2002/747/EC of 9 September 2002 establishing revised ecological criteria for the award of the Community ecolabel to light bulbs
Luminous efficacy	Cenelec	EN 50285:1999	Energy efficiency of electric lamps for household use — Measurement methods
Lamp caps	Cenelec	EN 60061:1993+ all amendments up to A40:2008	Lamp caps and holders together with gauges for the control of interchangeability and safety Part 1: Lamp caps
Lamp lifetime	Cenelec	EN 60064:1995+ A2:2003+A3:2006 A4:2007+A11:2007	Tungsten filament lamps for domestic and similar general lighting purposes – Performance requirements
	Cenelec	EN 60357:2003+ A1:2008	Tungsten halogen lamps (non-vehicle) — Performance specifications
	Cenelec	EN 60969:1993+ A1:1993+A2:2000	Self-ballasted lamps for general lighting services — Performance requirements
Lamp start time/ warmup time	Cenelec	EN 60969:1993+ A1:1993+A2:2000	Self-ballasted lamps for general lighting services — Performance requirements
Power factor	Cenelec	EN 61000-3-2:2006	Electromagnetic compatibility (EMC) Part 3-2:Limits — Limits for harmonic currentemissions (equipment input current ≤ 16 A per phase)

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Measured parameter	Organisation	Reference	Title
Specific effective radiant UV power	Cenelec	EN 62471:2008	Photobiological safety of lamps and lamp systems
Colour rendering	International Commission on Illumination	CIE 13.3:1995	Method of Measuring and Specifying Colour Rendering Properties of Light Sources
Chromaticity Correlated Colour Temperature (Tc [K])	International Commission on Illumination	CIE 15:2004	Colorimetry
Luminance	International Commission on Illumination	CIE 18.2:1983	The Basis of Physical Photometry
Luminous flux	International Commission on Illumination	CIE 84:1989	The Measurement of Luminous Flux
Lamp Lumen Maintenance Factor (LLMF) Lamp Survival Factor (LSF)	International Commission on Illumination	CIE 97:2005	Maintenance of indoor electric lighting systems

At the time of adoption of this Regulation, the best available technology on the market for the products concerned wasidentified as follows:在本法规正式通过时，市场上可利用的有关该产品的最佳技术确定如下：

1. LAMP EFFICACY灯的能效

The highest identified efficacy was 69 lm/W. 所确定的最高光效为69流明/瓦（lm/W）

2. LAMP FUNCTIONALITY灯的功能性

Functionality parameter 功能性参数	**Compact fluorescent lamps** 紧凑型荧光灯
Rated lamp lifetime 灯的额定寿命	20 000 h **20000**小时
Lumen maintenance 流明维持率	90 % at the rated lamp lifetime 在灯的额定寿命**90%**
Number of switching cycles 开关周期数	1 000 000 **1 000 000**
Starting time 启动时间	< 0,1 s; **<0.1**秒
Lamp warm-up time to 80 % Φ 达到**80% Φ**灯的预热时间	15 s, or 4 s for special mixed CFL/halogen lamps 特殊混合的紧凑型荧光灯（**CFL**）**/**卤素灯**15**秒**,** 或**4** 秒
Lamp power factor 灯的功率因数	0,95 **0,95**

3. LAMP MERCURY CONTENT灯的汞含量

The energy efficient compact fluorescent lamps with the lowest mercury content include not more than 1,23 mg mercury. 最低汞含量的节能紧凑型荧光灯包括不到1.23毫克的汞

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我们进行测试依据的指令和标准：

- EUP指令2005/32/EC及其实施措施244/2009/EC, 245/2009/EC
- 理事会指令98/11/EC家用灯能效标签
- 理事会决议2002/747/EC电灯泡生态标签
- EN 50285家用灯的能效要求
- EN/IEC 60432-1普通照明灯泡的安全要求
- EN/IEC 60432-2普通照明卤钨灯的安全要求
- EN/IEC 60432-3卤钨灯的安全要求（非车辆用）
- EN/IEC 61199单端荧光灯的安全要求
- EN/IEC 61195双端荧光灯的安全要求
- EN/IEC 60968普通照明用自镇流荧光灯的安全要求
- EN/IEC 62035放电灯（不包括荧光灯）的安全要求
- EN/IEC 60064普通照明灯泡的性能要求
- EN/IEC 60357卤钨灯的性能要求（非车辆用）
- EN/IEC 60901单端荧光灯的性能要求
- EN/IEC 60081双端荧光灯的性能要求
- EN/IEC 60969普通照明用自镇流荧光灯的性能要求
- EN/IEC 61167金卤灯的性能要求
- EN/IEC 60192低压钠灯的性能要求
- EN/IEC 60188高压汞灯的性能要求
- EN/IEC 62031通用照明LED模块的安全要求
- IEC 62417 照明和照明系统的光生物学安全
- IEC 60061-1灯头以及互换性和安全性的量规-Part 1:灯头部分
- IEC 60061-3灯头以及互换性和安全性的量规- Part 3:量规部分

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Thank You!